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UNIVERSITY OF MICHIGAN

SUGGESTED PROGRAMS OF STUDY

IN

## BUSINESS ADMINISTRATION

ANNOUNCEMENT

1922-1923



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**COMMITTEE ON BUSINESS ADMINISTRATION**

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Economics Building.

# SUGGESTED PROGRAMS OF STUDY IN BUSINESS ADMINISTRATION UNIVERSITY OF MICHIGAN

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## GENERAL STATEMENT

The curricula in Business Administration are suggested four-year programs of study arranged for students who are regularly enrolled in the College of Literature, Science, and the Arts, and who are candidates for a degree. They are intended to meet the needs of those persons who desire to fit themselves, by a combination of liberal culture and professional studies, for positions as executives and experts in industrial establishments or the public service.

Such programs are now offered in General Business, Accounting, Banking, Insurance, and Railway Administration. These programs cover four years of undergraduate study.

## CONDITIONS OF ADMISSION

Persons desiring to pursue these programs must gain admission to the College of Literature, Science, and the Arts, as candidates for a degree, or to the Graduate School, as explained in the Catalogue of the University. They are then expected to enroll with the Clerk of the Committee on Business Administration at the beginning of their first year of residence or as soon thereafter as possible, *but not later than the beginning of their last year of residence.*

## SYSTEMS OF ELECTIONS

It is not intended that the precise requirements set forth in these programs shall be rigidly insisted upon. Under the advice of the Chairman of the Committee, the student will be permitted to modify his program or arrange one better adapted to his special needs. In all cases, however, students must take Courses 1 and 2 in Mathematics, and a minimum of 30 hours in Political Economy and Business Administration, exclusive of Courses 1 and 2. (For the purpose of this requirement, Courses 51, 52, 53, 54, 55, 56, 67, and 68 in Mathematics will be considered as Business Administration.) In addition to these requirements all students must observe



the restrictions governing their elections established by the faculty of the College of Literature, Science, and the Arts. Students enrolled in these programs having 60 hours to their credit and a good record for scholarship may, with the consent of the Committee, elect in the College of Engineering the courses designated in these programs. For all such courses elected outside the College of Literature, Science, and the Arts an authorization blank, properly filled out, must be secured from the Chairman of the Committee. The credit so obtained outside of the College will be counted toward the literary degree, only on condition that the student finishes the four-year program in which the outside course occurs.

### **SPECIAL CERTIFICATE**

Any student who, in covering the work required for the degree of Bachelor of Arts, completes any one of the suggested programs of study, or any similar program which may be approved by the Committee on Business Administration, as outlined above, will be entitled to receive, in addition to his diploma, a special certificate conferred by the Board of Regents upon the recommendation of the faculty.

### **GRADUATE STUDY**

Students who have secured a bachelor's degree as a result of studies along other lines will find in the more advanced courses here offered an opportunity for profitable specialization; and the rules governing graduate work will apply to graduate students who enroll themselves as students in these courses. Those interested in this grade of studies should consult the Annual Announcement of the Graduate School.

Any student who desires to enlarge the general culture element of his undergraduate course beyond the 80 or 90 hours which it includes in these programs may do so with the hearty coöperation of the Committee by planning a fifth year, to which a portion of the professional courses may be transferred.

Graduate students who complete satisfactorily an approved program of study in Business Administration extending for at least one year will be entitled to receive a special certificate, whether or not they are candidates for graduate degrees.

### **COMMERCE CLUB**

The Commerce Club is an active organization which brings together the university men interested in the study of industrial subjects. It is frequently addressed by business men who are its invited guests; and it arranges an annual trip for the study of well-organized business institutions. This club invites into its membership students enrolled in the courses in Business Administration, after they have completed three semesters of work.

## SPECIAL LECTURES

Numerous special lectures are given each year upon business topics of the day, by men of expert knowledge, who are invited to Ann Arbor to address the students who are specializing in Business Administration.

## FOR FURTHER INFORMATION

For further information concerning the courses offered in Business Administration, address the Clerk of the Committee, Room 105, Economics Building, Ann Arbor, Michigan.

For printed information concerning the requirements for admission to the University, dates of entrance examinations, conditions of admission to advanced standing, or requirements for graduation, address the Secretary of the University, Ann Arbor, Mich. Special correspondence on these subjects should be addressed to Professor JOHN R. EFFINGER, Dean of the College of Literature, Science, and the Arts, The University, Ann Arbor, Mich.

For information concerning graduate study, address Professor ALFRED H. LLOYD, Dean of the Graduate School, The University, Ann Arbor, Mich.

## SUGGESTED PROGRAMS OF STUDY

In order to make clear the character of the work offered in Business Administration, there are inserted at this point, in tabular form, five suggested programs of study. Following the tabulations will be found a detailed description of each of the courses to which reference is made.

*In the selection of electives the student should consult the instructor in charge of the particular program in which he is interested.*

*Not more than sixteen hours a week may be elected except by special permission obtained from the Committee on Extra Hours in accordance with the rules of the College of Literature, Science, and the Arts.*

## GENERAL BUSINESS

This program includes a balanced arrangement of studies selected from each department of business administration: law, accounting, finance, commerce, and the executive art. It is recommended to students who desire to fit themselves to become general executives, that is to say, who desire to prepare themselves for such positions as that of branch manager, office manager, general superintendent, sales manager, employment manager, or superintendent in charge of industrial relations. It is further recommended to students who intend to specialize in graduate years, or who are not yet decided in what direction their advanced work will be carried.

## FIRST YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Rhetoric 1 .....	3	Rhetoric 2 .....	3
Mathematics 1 .....	4	Mathematics 2 .....	4
Electives .....	8	Electives .....	8
	<hr/>		<hr/>
	15		15

## SECOND YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 1. Principles of Economics I.....	3	Economics 2. Principles of Economics II.....	3
Economics 38. Principles of Accounting I.....	4	Economics 39. Principles of Accounting II.....	4
Electives .....	9	Electives .....	9
	<hr/>		<hr/>
	16		16

## THIRD YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 6. Railway Problems .....	3	Economics 15. Corporations .....	3
Economics 9. Money and Banking .....	3	Economics 32. Industrial Organization and Management .....	3
Economics 31. Marketing .....	3	Economics 33. Foreign Trade .....	2
Electives .....	7	Electives .....	8
	<hr/>		<hr/>
	16		16

## FOURTH YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 3. Labor Problems .....	3	Economics 34. Personnel Administration .....	2
Economics 37. Corporation Finance .....	3	Economics 47. Business Law II .....	3
Economics 46. Business Law I .....	3	Electives .....	11
Electives .....	7		<hr/>
	<hr/>		<hr/>
	10		16



## ACCOUNTING

This program is intended (a) for those who wish to enter the profession of public accounting, (b) for those who expect to occupy positions as accountants in financial, manufacturing, mercantile, or public utility industries, (c) for those who are preparing themselves for positions as accountants or statisticians to municipalities and regulative bodies such as railroad or public service commissions, and (d) for those who are intending to teach accounting.

Students who have completed the first two years of the program in Accounting are prepared to take Course 48 in Insurance Accounting. This would fit them for responsible positions in various home office departments of insurance companies and state departments of insurance. It would not be necessary for them to take the advanced courses in Mathematics required of those intending to enter the actuarial profession.

### FIRST YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Rhetoric 1 .....	3	Rhetoric 2 .....	3
Mathematics 1 .....	4	Mathematics 2 .....	4
Electives .....	8	Electives .....	8
	15		15

### SECOND YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 1. Principles of Economics I.....	3	Economics 2. Principles of Economics II.....	3
Economics 38. Principles of Accounting I.....	4	Economics 39. Principles of Accounting II.....	4
Mathematics 51. Interest.	3	Mathematics 52. Insurance	3
Electives .....	6	Electives .....	6
	16		16

### THIRD YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 6. Railway Problems .....	3	Economics 15. Corporations .....	3
Economics 9. Money and Banking .....	3	Economics 43. Auditing and C. P. A. Problems..	3
Economics 40. Cost Accounting .....	3	Economics 43a. Income Tax Procedure .....	2
Electives .....	7	Electives .....	8
	16		16

## FOURTH YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 37. Corpora- tion Finance .....	3	Economics 16. Public Serv- ice Industries .....	2
Economics 44. The The- ory of Accounting.....	2	Economics 36a. Railway Accounts .....	3
Economics 46. Business Law I .....	3	Economics 47. Business Law II .....	3
Electives .....	8	Electives .....	8
	<hr/>		<hr/>
	16		16

## BANKING

This program is designed for students who expect to enter bank-  
ing or allied fields. Its aim is to enable the student to master the  
principles underlying financial operations and, at the same time, to  
provide him with a foundation of cultural studies.

## FIRST YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Rhetoric 1 .....	3	Rhetoric 2 .....	3
Mathematics 1 .....	4	Mathematics 2 .....	4
Electives .....	8	Electives .....	8
	<hr/>		<hr/>
	15		15

## SECOND YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 1. Principles of Economics I.....	3	Economics 2. Principles of Economics II.....	3
Economics 38. Principles of Accounting .....	4	Economics 39. Principles of Accounting II.....	4
Electives I.....	9	Electives .....	9
	<hr/>		<hr/>
	16		16

## THIRD YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 6. Railway Problems .....	3	Economics 15. Corpora- tions .....	3
Economics 9. Money and Banking .....	3	Economics 12. Foreign Exchange .....	2
Economics 31. Marketing.	3	Economics 33. Foreign Trade .....	2
Electives .....	7	Electives .....	9
	<hr/>		<hr/>
	16		16



## FOURTH YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 32. Industrial Organization and Management .....	3	Economics 10. Economic Cycles .....	3
Economics 37. Corporation Finance .....	3	Economics 14. Economic Statistics .....	3
Economics 46. Business Law I .....	3	Economics 47. Business Law II .....	3
Electives .....	7	Electives .....	7
	<hr/> 16		<hr/> 16

## RAILWAY ADMINISTRATION

This program is designed to meet the needs of four classes of students: (a) those who wish to enter the administrative department of railways, (b) those who desire to become attached to federal or state railway commissions, (c) persons preparing for the statistical or appraisal work of banking or brokerage houses, and (d) those desiring to understand the transportation problem as a part of a general education.

## FIRST YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Rhetoric 1 .....	3	Rhetoric 2 .....	3
Mathematics 1 .....	4	Mathematics 2 .....	4
Electives .....	8	Electives .....	8
	<hr/> 15		<hr/> 15

## SECOND YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 1. Principles of Economics I.....	3	Economics 2. Principles of Economics II.....	3
Economics 38. Principles of Accounting I.....	4	Economics 39. Principles of Accounting II.....	4
Mathematics 51. Interest.	3	Mathematics 52. Insurance	3
Electives .....	6	Electives .....	6
	<hr/> 16		<hr/> 16

THIRD YEAR			
<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 6. Railway Problems .....	3	Economics 15. Corporations .....	3
Economics 9. Money and Banking .....	3	Economics 32. Industrial Organization and Management .....	3
Civil Engineering 20. Railway Location .....	2	Civil Engineering 21. Economics of Railroad Location and Construction ..	2
Electives .....	8	Electives .....	8
<hr/>		<hr/>	
16		16	

FOURTH YEAR			
<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Economics 36. Railway Organization and Operation ..	3	Economics 16. Public Service Industries .....	2
Economics 37. Corporation Finance .....	3	Economics 36a. Railway Accounts .....	3
Economics 46. Business Law I .....	3	Economics 47. Business Law II .....	3
Mechanical Engineering 24. Prime Movers.....	3	Civil Engineering 23. Railroad Construction and Maintenance .....	2
Civil Engineering 22. Railroad Construction and Maintenance .....	2	Electives .....	6
Drawing 12 (Engineering Department). Statistical Charting .....	2	<hr/>	
<hr/>		16	

## INSURANCE

The following program is designed for the student who intends to enter the actuarial profession, either in life or casualty insurance, or who expects to undertake statistical work of an advanced nature. While the actuarial and mathematical phases of insurance are emphasized, it may be pointed out that the training thus secured frequently leads to other lines of official work, such as secretarial, managerial, and executive. *The first two years of this program may be taken with profit by any student in business administration who desires to obtain a working knowledge of financial mathematics, elements of life insurance, elements of statistics, and their applications to business.*

Students who have completed the first two years of the program in Accounting are prepared to take Courses 48a and 48b in Insurance Accounting. This would fit them for responsible positions in various

home office departments of insurance companies and state departments of insurance. It would not be necessary for them to take the advanced courses in Mathematics required of those intending to enter the actuarial profession.

Students taking the program in General Business or the program in Banking may fit themselves for similar positions by adding Mathematics 49, 51, and 52 in the second year, and Courses 48a and 48b in Insurance Accounting in the third or fourth year.

For further information, students are advised to consult the professor in charge, 405 Mason Hall, and the special announcement of courses in financial, statistical, and actuarial mathematics.

## FIRST YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Rhetoric 1 .....	3	Rhetoric 2 .....	3
Mathematics 1 .....	4	Mathematics 2 .....	4
Electives .....	8	Electives .....	8
	<hr/>		<hr/>
	15		15

## SECOND YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Mathematics 51. Interest .....	3	Mathematics 52. Interest and Insurance .....	3
Mathematics 3 or 3E. Calculus .....	3 or 5	Mathematics 4 or 4E. Calculus .....	3 or 5
Economics 1. Principles of Economics I.....	3	Economics 2. Principles of Economics II.....	3
Electives .....	6 or 4	Electives .....	6 or 4
	<hr/>		<hr/>
	15		15

## THIRD YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Mathematics 53. Theory of Probability .....	3	Mathematics 54. Finite Differences .....	3
Mathematics 49. Elementary Methods in Statistics .....	2	Mathematics 50. Mathematical Theory of Statistics .....	2
Mathematics 13. Higher Algebra (I) .....	3	Mathematics 14. Higher Algebra (II) .....	3
Economics 38. Principles of Accounting I.....	4	Economics 39. Principles of Accounting II.....	4
Electives .....	4	Electives .....	4
	<hr/>		<hr/>
	16		16



## FOURTH YEAR

<i>First Semester</i>		<i>Second Semester</i>	
Courses	Credit	Courses	Credit
Mathematics 55. Advanced Mathematical Theory of Interest and Life Contingencies (I) .....	3	Mathematics 56. Advanced Mathematical Theory of Interest and Life Contingencies (II) .....	3
Mathematics 59. Advanced Mathematical Theory of Statistics (I) .....	2	Mathematics 60. Advanced Mathematical Theory of Statistics (II) .....	2
Mathematics 67. Casualty Actuarial Theory .....	2	Mathematics 68. Seminary in Actuarial Theory.....	2
Economics 46. Business Law I .....	3	Economics 47. Business Law II .....	3
Economics 48a. Insurance Accounting .....	2	Economics 48b. Insurance Accounting .....	2
Electives .....	4	Electives .....	4
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## DESCRIPTION OF COURSES LISTED IN PRECEDING PROGRAMS OF STUDY\*

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### POLITICAL ECONOMY AND BUSINESS ADMINISTRATION

1. Principles of Economics, I. *Both semesters. Three hours.* Professor TAYLOR, Dr. MAY, Messrs. CAHOW, BRADFORD, WYNGAARDEN, PETERSON, OPPENHEIM, KNIGHT, SCOTT, SMITH, and MEIKLEJOHN.

This course and Course 2 constitute a general course in the principles of economics which must precede all other courses in economics except 1A, 1E, 1G, and 38.

2. Principles of Economics, II. *Second semester. Three hours.* A continuation of Course 1. Professor TAYLOR, Dr. MAY, and Messrs. CAHOW, OPPENHEIM, and SCOTT.

This course is a continuation of Course 1, by which it must be preceded.

3. Labor Problems. *First semester. Three hours.* Assistant Professor LUBIN.

This course is designed to give the student a descriptive and analytic outline of the chief problems arising out of the wage-earner's place and part in modern industry, and the relation of the labor interest to current trends in modern society. It will undertake to disclose the historic background of the modern labor movement; to analyze the economic doctrines involved in current and past controversies over wages and trade organizations; and to pass in critical review the many plans submitted for the solution of definite phases of the labor problem, especially those that rely on legislative enactments and administrative supervision.

Prerequisites: Courses 1 and 2.

6. Railway Problems. *First semester. Three hours.* Professor SHARFMAN and Mr. CAVERLY.

This course considers the social and industrial significance of modern transportation, traces the development of railway transportation, analyzes the chief railway problems in the United States, with special reference to the nature of railway competition and the theory and practice of rate-making, and devotes particular attention to the regulation of railways by the federal government. The course will be concluded by a

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\* For other courses in Political Economy and Business Administration, see regular Announcement of College of Literature, Science, and the Arts.

discussion of the war administration of the railroads and of the adjustments in railway regulation which accompanied the return of the roads to private operation.

Prerequisites: Courses 1 and 2.

9. Money and Banking. *Both semesters. Three hours.* Assistant Professor CALHOUN.

This course undertakes an analysis of banking theory and organization. It will include a discussion of banking as an agency for capital supply and of the relationship between bank credit, money and prices. Particular attention will be given to the Federal Reserve System.

Prerequisites: Courses 1 and 2.

10. Economic Cycles. *Second semester. Three hours.* Professor DAY.

This course deals with the character, the statistical measurement and the explanation of the economic cycle. Attention is also given to methods of business forecasting.

Prerequisites: Courses 1, 2, and 9.

This course is open only to seniors and graduate students.

12. Foreign Exchange. *Second semester. Two hours.* Assistant Professor CALHOUN.

This course treats of the principles and methods of foreign exchange. It will include a study of the fluctuation of exchange rates since the war.

Prerequisites: Courses 1, 2, and 9.

14. Economic Statistics. *Second semester. Three hours.* Professor DAY.

This course is designed to acquaint the student with the sources and analysis of the more important statistical data of economic science.

Prerequisites: Courses 1, 2, and 9.

This course is open only to seniors and graduate students.

15. Corporations. *Second semester. Three hours.* Professor SHARFMAN and Mr. CAVERLY.

This course undertakes a study of corporations as an element in industrial society, laying special emphasis upon the so-called trust problem and questions of government regulation of industry. It deals with the forms of business organization, with particular stress on the nature and history of corporations and their significance in modern life. While it offers an account of the promotion, capitalization, and reorganization of corporations, questions of finance are for the most part subordinated to a consideration of the economic aspects of industrial combination, such as its effects upon efficiency, wages, profits,



and prices. The course is concluded by a study of the Sherman Anti-Trust Act and a discussion of the recent trust legislation.  
Prerequisites: Courses 1 and 2.

16. Public Service Industries. *Second semester. Two hours.* Professor SHARFMAN.

This course considers the nature of public service industries, such as railroads, street railways, gas and electric companies, telephone and telegraph companies, etc., and their relation to the state and to the municipality. The problem of public ownership and public control is given careful study on the basis of American and European experience, with special consideration of commission regulation in the United States.

Prerequisites: Courses 1, 2, 6, 15, 38, and 39.

This course is open only to seniors and graduate students.

31. Marketing. *First semester. Three hours.* Professor GRIFFIN.

This is a fundamental course in the principles and methods of marketing. It will include a discussion of the marketing of raw materials, and of agricultural and manufactured products; and a consideration of the characteristics of the wholesale and retail trade. Some specific problems of marketing, such as speculation, elimination of middlemen, price maintenance, and the cost of marketing, will be considered. The course will be concluded by a survey of selling policies of the manufacturer.

Prerequisites: Courses 1 and 2.

32. Industrial Organization and Management. *Both semesters. Three hours.* Assistant Professor EDMONDS.

This is a fundamental course in the principles of internal organization and management of industrial enterprises. It will include a discussion of the nature of modern industry and of present industrial tendencies; types of internal organization, the location and arrangement of industrial plants; planning, supervision, and control, purchasing policies, scientific management, and the employment of labor.

Prerequisites: Courses 1 and 2.

33. Foreign Trade. *Second semester. Two hours.* Professor GRIFFIN.

This course deals with the nature and content of Foreign Trade. It is introduced with a discussion of the economic problems underlying foreign trade. It then presents a survey of the nature and direction of the foreign trade of the United States, England, Germany, and France, and a discussion of their foreign organization. Ocean transportation, foreign investments, government restriction and promotion of trade, and the marketing policies of American exporters are studied.

Prerequisites: Courses 1, 2, 9, and 31.

34. Personnel Administration. *Second semester. Two hours.* Assistant Professor EDMONDS.

This is a course in the employment, training, control, and compensation of labor. In the latter part of the course consideration is given to the problem of industrial relations as viewed from the standpoint of the management. The course is designed to give students a knowledge of the fundamental problems involved in the employment and supervision of employees' relations.

Prerequisites: Courses 1, 2, and 32.

- [36. Railway Organization and Operation. *First semester. Three hours.*

This course undertakes a study of problems incident to the operation of steam railroads from the standpoint of both the railway administrative officer and of public regulatory bodies. It deals with problems of railway organization, and administrative methods of controlling expenses, and of auditing revenues. It considers the use of statistics as an aid to the attainment of economies in operation.

Prerequisites: Courses 1, 2, 6, and 38.

Omitted in 1922-1923.]

- 36a. Railway Accounts. *Second semester. Three hours.* Assistant Professor SCHMITT.

This course undertakes a study of the standardized system of accounts prescribed for railroads by the Interstate Commerce Commission. It deals with construction, revenue, expense, income, profit and loss, and balance sheet accounts. This course gives special emphasis to the use of accounting statements by operating officers, by public service commissions, and by investors in railway securities.

Prerequisites: Courses 1, 2, 6, 38, and 39.

37. Corporation Finance. *First semester. Three hours.* Professor SHARFMAN.

This course aims to study the organization and intercorporate relations of modern railway and industrial enterprises, with special reference to problems of finance. It deals with such subjects as the nature and varieties of stocks and bonds, the distribution and price movements of corporation securities, corporate promotion, capitalization, and reorganization.

Prerequisites: Courses 1, 2, and 15.

38. Principles of Accounting, I. *Both semesters. Four hours.* Professor PATON, Mr. ROSS, Mr. HORNER, and Mr. GEE.

This introductory course consists primarily in a study of the

principles of the double-entry system, the more important technical devices of accounting being briefly considered in this connection. The classification of accounts for managerial and other purposes, the significance and determination of business income, and the treatment of partners' accounts are among the special topics discussed. Particular attention is given to periodic ledger analysis, to the construction and use of working sheets, and to the preparation of statements of income and financial condition.

Course I must precede or accompany this course.

39. Principles of Accounting, II. *Both semesters. Four hours.* Professor PATON, Assistant Professor SCHMITT, and Mr. ROSS.

This is a continuation of Course 38. It is also open (with permission) to students who have completed Course 38E. The work of this course includes a study of the corporate proprietary accounts (capital stock, surplus, dividends, and reserves) and corporate liabilities, the treatment of bond discounts and premiums receiving especial consideration. Among the topics in valuation discussed are the problems of the organization period, the bases for revaluation, depreciation policies and procedures, and the treatment of the intangible assets. A considerable time is devoted to the construction and analysis of detail and summary financial statements.

Prerequisites: Courses 1 and 38.

40. Cost Accounting. *First semester. Three hours.* Assistant Professor SCHMITT.

This course undertakes an analysis of accounts and accounting statements for manufacturing concerns, with special reference to the problems of management. Various methods of allocating indirect expenses to production factors and to specific products are studied. The principles of costing are illustrated in a complete cost set which is worked out by the student as a laboratory exercise.

Prerequisites: Courses 1, 2, 38, and 39.

43. Auditing and C. P. A. Problems. *Second semester. Three hours.* Assistant Professor SCHMITT.

This is an advanced course designed to meet the needs of students who have a professional interest in accounting. In studying the technique of auditing, C. P. A. examination questions are largely used for illustrative material. During the semester each student is required to prepare a report on a special system of accounts of some particular line of business such as retailing, building, brokerage, farming, etc.

Prerequisites: Courses 1, 2, 38, and 39.



- 43a. Income Tax Procedure. *Second semester. Two hours.* Professor PATON.

In this course are considered the important features of the income and profits tax program of the federal government, with especial reference to their relation to accounting.

Prerequisites: Courses 1, 2, 38, and 39.

44. The Theory of Accounting. *First semester. Two hours.* Professor PATON.

This is an advanced course in theory and may be elected only with the permission of the instructor. Readings and problems will be assigned and three written papers will be required.

Prerequisites: Courses 1, 2, 38, and 39.

46. Business Law, I. *First semester. Three hours.* Mr. WOLAVER.

This course, designed to meet the special needs of students in business administration, deals with the legal significance of the more important business situations likely to arise in commercial and industrial life. It undertakes, through a study of concrete cases and legal rules, to acquaint the student with the point of view of the law, as a means of helping to prepare the business man to avoid legal controversy as far as possible, and to coöperate intelligently with legal counsel when litigation cannot be avoided.

The training afforded by this course and the subject matter with which it deals extend through the entire year, and students electing Course 46 in the first semester will be expected to elect Course 47 in the second semester.

During the first semester the course deals primarily with contractual transactions, involving a study of the leading principles of the law of contracts, sales, and commercial paper. During the second semester the course deals largely with legal questions arising out of the various forms of business association, involving a study of the leading principles of the law of agency, partnership, and corporations. Throughout the course emphasis is laid upon the practical application of legal rules in ordinary business dealings.

This course is not open to students intending to pursue the professional study of law.

Prerequisites: Courses 1 and 2.

47. Business Law, II. *Second semester. Three hours.* Mr. WOLAVER. For a full description of the scope and character of this course, see Course 46, given in the first semester, of which it is a continuation and by which it must be preceded.

This course is not open to students intending to pursue the professional study of law.

Prerequisites: Courses 1, 2, and 46.

- 48a. Insurance Accounting. *First semester. Two hours.* Mr. —  
This course includes an exhaustive study of home office accounting and card systems and tabulating machine equipment used in life, fraternal, casualty, fire, and miscellaneous insurance companies. Annual reports and interim statements are analyzed and the preparation of technical items explained.

This course is open to students who have taken Accounting 38 and Mathematics 51 and 52.

Prerequisites: Courses 1, 2, and 38 in Economics, and Mathematics 51 and 52.

- 48b. Insurance Accounting. *Second semester. Two hours.* Mr. —  
This course is a continuation of Course 48a, by which it must be preceded.

### MATHEMATICS

13. Higher Algebra (I). *First semester. Three hours.* Professor KARPINSKI.

14. Higher Algebra (II). *Second semester. Three hours.* Professor KARPINSKI.

49. Elementary Methods in Statistics. *Both semesters. Two hours.* Professors GLOVER and CARVER, Assistant Professor ROBBINS, and Mr. BARNARD.

This course deals with the construction of schedules, gathering data, editing schedules, and arranging and presenting statistics in various tabular and graphical forms.

50. Mathematical Theory of Statistics. Introductory Course. Professors GLOVER and CARVER, Assistant Professor ROBBINS, and Mr. BARNARD.

This course deals with the elementary theory and applications of mathematical statistics and will include a study of such topics as averages, measures of dispersion, and coefficients of correlation.

Course 50 must be preceded by Course 49.

51. Introduction to the Mathematical Theory of Interest and Insurance (I). *Both semesters. Three hours.* Professors GLOVER and CARVER, Assistant Professor ROBBINS, and Mr. BARNARD.

The aim of this course is to explain and illustrate the applications of mathematics to financial transactions to such an extent as may be of interest and value to the general student. The following subjects are considered: compound interest and discount, the construction and use of interest tables, annuities certain, sinking funds, determination of interest, depreciation, renewal and other fixed charges in an industrial undertaking,

valuation and amortization of securities, loans repayable by equal installments, including principal and interest.

Course 51 must be preceded or accompanied by Course 1 (or 1E) in mathematics.

52. Introduction to the Mathematical Theory of Interest and Insurance (II). *Both semesters. Three hours.* Professors GLOVER and CARVER, Assistant Professor ROBBINS, and Mr. BARNARD. A continuation of Course 51. The theory of interest is developed further and applied to financial calculations and life insurance. The theory of probability is presented briefly as an introduction to the mathematics of life insurance. The treatment of insurance includes the development of formulae for commutation columns, premiums, reserves, and practice in their computation.

Course 52 should be preceded by Course 51.

53. Theory of Probability. *First semester. Three hours.* Professor GLOVER.

This course deals with fundamental concepts and seeks to establish the connection between *a priori* and empirical probabilities. Much time is also given to the demonstration of theorems in selection, arrangement, distribution, and derangement, and their application to the solution of problems in choice and chance.

54. Finite Differences. *Second semester. Three hours.* Professor GLOVER.

This course includes a study of numerous interpolation formulas, special functions occurring in finite difference theory, finite integration, summation of series, and solution of elementary difference equations.

55. Advanced Mathematical Theory of Interest and Life Contingencies (I). *First semester. Three hours.* Professor GLOVER.

This course embraces an examination of the properties of various mathematical functions employed in the theory of interest and their development and expansion in series, a study of the annuity certain, cumulative sinking fund, and repayment, amortization, conversion, and consolidation of securities. Also a detailed study of life annuities and assurances, the construction of premiums for varying benefits, methods of loading net premiums, theory of policy values, and various methods and plans of reserve valuation.

Course 55 is open to those who have completed Courses 3 (or 3E), 4 (or 4E), 52, 53, and 54 in mathematics.

56. Advanced Mathematical Theory of Interest and Life Contingencies (II). *Second semester. Three hours.* Professor GLOVER.

The following subjects are considered in this course: determination of the rate of interest involved in an annuity and various financial transactions; capital redemption assurances, construc-



tion of interest tables; probabilities of survivorship; statistical applications of the mortality table; functional representation of the law of mortality; construction and graduation of mortality tables by various methods; contingent assurances; reversionary annuities; compound survivorship annuities and assurances; various methods of interpolation, and summation formulas. The course also includes a general discussion of the theory of reduction of population statistics and a study of the premium as an analytic function.

The Text-book of the Institute of Actuaries is used as a basis of study in Courses 55 and 56. This text is supplemented, however, by frequent references to the standard actuarial journals and other sources of information. Much attention will be given to home office systems now employed in the routine work of legal reserve life insurance companies and fraternal societies and to the preparation of premiums and rate books, valuations, gain and loss exhibits, monthly, quarterly, and annual reports, theory of total disability insurance, and the analysis of mortality experiences. This study is intended to equip the student for the practical work which the actuary and other officers of life companies have to perform.

This course must be preceded by Course 55, of which it is a continuation.

59. Mathematical Theory of Statistics. Advanced Course. *First semester. Two hours.* Mr. BARNARD.

This course includes a development of the series of Bernoulli, Poisson, and Lexis and a discussion of their properties, together with a study of the normal curve of error and its applications to the theory of least squares and the graduation of frequency series.

60. Mathematical Theory of Statistics. Advanced Course. *Second semester. Two hours.* Mr. BARNARD.

This course is a continuation of Course 59, by which it must be preceded. The course includes a study of the methods of graduating frequency series as developed by Pearson and Charlier, the higher characteristics of frequency distributions, the theory of probable error, and the theory of correlation.

67. Casualty Actuarial Theory. *First semester. Two hours.* Assistant Professor ROBBINS.

A study of the theory and calculations of premiums and reserves for health, accident, workmen's compensation, and other branches of casualty insurance.

68. Seminary in Casualty Actuarial Theory. *Second semester. Two hours.* Assistant Professor ROBBINS.

The preparation of various schedules which supplement the annual statements, and a study of current articles dealing with problems in casualty insurance, form the basis of this course.

**COLLEGE OF ENGINEERING**

Mechanical Engineering 24. Prime Movers. *First semester. Three hours.*

This course is offered primarily for Business Administration and Forestry students. It embraces a study of the steam engine, gas engine, and water turbine, together with the study of the various methods of transmitting the power from these prime movers. This subject is covered in a popular way, and, in addition, attention is given to the operation of the various machines.

This course should be preceded by Courses 1 and 2 in Physics.

Civil Engineering 20. Railroad Location. *First semester. Two hours.*

Field and office methods of Railroad Location. Train Resistance. Curve Resistance. The Vertical Profile. One lecture and recitation period per week, and one three-hour drawing-room period per week.

Civil Engineering 21. Economics of Railroad Location and Construction. *Second semester. Two hours.*

Organization and Capitalization of Railroads. Estimation of Volume of Traffic. The Locomotive. Locomotive Types. Engine Rating. Assistant Engineers. Resistance to Traction. The Influence of Location in Earning Power. The Economics of Track and Roadway Construction.

Civil Engineering 22. Railroad Construction and Maintenance. *First semester. Two hours.*

Grading, Track, Railway Structures, Water, Fuel, and Icing Stations. Types of Construction. Methods of Cost of Construction.

Civil Engineering 23. Railroad Construction and Maintenance. *Second semester. Two hours.*

A continuation of Course 22 throughout the second semester.

Drawing 12. Statistical Charting. Lectures and drawing-room work. *First semester. Two hours.*

A study of the statistical method and of charting in particular. The aim of the course is to give the student a thorough training in the construction, use, and analysis of statistical charts. The lectures will furnish the fundamental principles of statistics and of charting. These will be applied in the drawing room to industrial, social, transportation, or other statistical problems.







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Other Announcements of the several departments of instruction, Reports and Communications of University officers, etc.